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ABSTRACT

The public schools reform movement has led to a proliferation of minimum competency testing programs by states. At the 11th/12th grade level, the Texas Educational Assessment of Minimum Skills (TEAMS), mandated by Texas House Bill 72, is an exit exam, divided into two sections which measure minimum competencies in math and language skills. Students failing to demonstrate mastery are required to retake and master that portion(s) of the exam to graduate from a Texas-accredited high school. Thus, methods of early identification of students at risk to fail the TEAMS exit test should be useful to school personnel. This study, conducted for the Lubbock Independent School District, isolated six variables which, in various combinations, predicted students' TEAMS scores at approximately 80 percent accuracy. TEAMS language and math scores were predicted using six different combinations of scores on the 6th-grade California Achievement Test Total Reading, 8th-grade Short Form Test of Academic Aptitude Language IQ, 8th-grade Short Form Test of Academic Aptitude Non-language IQ Scores, 9th-grade Texas Assessment of Basic Skills Total Writing, 9th-grade Texas Assessment of Basic Skills Math Scores, and 10th-grade math course grade point averages. As some of these variables may be collected and TEAMS scores predicted up to two years before students first take the TEAMS exit test, a variety of remediation options are available to school districts. The TEAMS study variable list is appended. (Author/JAZ)

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A Method for Early Identificaton of Students Likely to Fail A Minimum Competency Exit Level Test: Early Prediction of Scores on the Texas Educational Assessment of Minimum Skills (TEAMS)

By

Jeff Q. Bostic and Barbara G. Hyink

Texas Tech University/Lubbock Independent School District

Jerrell W. Snodgrass

Lubbock Independent School District

1628 19th Street

Lubbock, TX 79401

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A Method for Early Identificaton of Students Likely to Fail A Minimum Competency Exit Level Examination: Early Prediction of Scores on the Texas Educational Assessment of Minimum Skills (TEAMS)

Abstract

The public schools reform movement has led to a proliferation of minimum competency testing programs across the nation. At the 11th/12th grade level, the Texas Educational Assessment of Minimum Skills (TEAMS) is an exit exam, divided into two sections which measure math skills and language skills, respectively. Mandated by Texas House Bill 72, Section 101.2(e), the TEAMS exit exam is administered to high school juniors. Since students failing to demonstrate mastery of one or both portions of the test are required to retake and master that portion(s) in order to qualify for graduation from a Texas-accredited high school, methods of early identification of those students at risk to fail the TEAMS exit test should be useful to school personnel. This study isolated six variables which predicted students' TEAMS scores at approximately 80% accuracy. TEAMS language scores were reliably predicted using 8th-grade Short Form Test of Academic Aptitude Language IQ Scores, 6th-grade California Achievement Test Total Reading Obtained Grade Equivalent Scores, and 9th-grade Texas Assessment of Basic Skills Total Writing Scores. TEAMS math scores were best predicted with 8th-grade Short Form Test of Academic Aptitude Nonlanguage IQ Scores, 9th-grade Texas Assessment of Basic Skills Math Scores, and 10th-grade math course grade point averages. As some of these variables may be collected and TEAMS scores predicted for students up to two years before they first take the TEAMS exit test, a variety of remediation options are available to school districts.

We gratefully acknowledge the assistance of John C. Carey in the design of this study, Cynthia Chambers for artwork, and Billy E. Askins in the preparation of this presentation.

The public schools reform movement has led to a proliferation of minimum competency testing programs across the nation. This is an outgrowth of societal pressures for schools to be accountable for learning that does or does not take place within them. As of January 1985, some form of minimum competency testing (MCT) had been established in 39 of the 50 states (Pipho & Hadley, 1986). Standards set by these exams include determination of who should graduate, be promoted, exit early from high school, receive extra help, or be excused from specific courses. Yet, MCT varies markedly among states. Since education is historically and Constitutionally a state enterprise, it is doubtful that a uniform federal standard will arise, although the idea has been proposed (Lazarus, 1981). A consequence of this diversity is the inability to generalize across state lines. Of the 39 states mandating competency tests in the basic skills, 20 require their students to pass exit level exams. Three more states leave exit level testing to the discretion of the local school districts (Pipho & Hadley). The remaining states have studies or proposals under way regarding MCT. As a result, MCT has become a pervasive and controversial national phenomenon (McCarthy, 1983).

Texas, in 1985, implemented the Texas Educational Assessment of Minimum Skills (TEAMS) exit exam (mandated by Texas House Bill 72, Sec. 101.2 (e)). This study focused only on this exit level exam given in the 11th-12th grades, although TEAMS tests are administered in grades 1, 3, 5, 7, and 9 as well; accordingly,

subsequent references in this paper to the TEAMS test refer only to the TEAMS exit level exam. The TEAMS is divided into two sections which measure math skills and language skills, respectively. Scaled scores for each section are reported in a range extending from 350-1000. In 1985, the minimum score for mastery of the language section was 670, and the minimum score for mastery of the math section was 612. In 1986, the minimum "passing" scores were raised to 700 for the language section and 629 for the math section.

The test was first administered in the Fall of 1985 to high school juniors in accredited Texas high schools. Students failing to demonstrate mastery of one or both portions of the test are required to retake and master that portion(s) in order to qualify for graduation from an accredited Texas high school. In the Fall 1985 TEAMS administration, approximately 15% of the students taking the test failed to master at least one portion. In the Lubbock Independent School District, a total of 303 students (16.3%) failed at least one portion of the 1985 TEAMS.

Minimum competency testing can serve as a valuable tool in the identification of students who have not attained the basic skills in language arts and math. However, identifying this deficiency at the 11th grade comes rather late in the student's educational career. A student identified as "at-risk" to fail the MCT and therefore in danger of not graduating with his peers may suffer emotional trauma. This may provide the impetus to cause

this student to drop out of high school. Serow (1983) reports that MCT failers do indeed have disproportionately high dropout rates. A more promising solution would be to identify these students as early as possible, and take steps toward remediation.

Early identification of students at risk can solve several problems. With early identification, educators have time to utilize programs that may prevent the predicted failure. Administrators have time to plan for the allocation of resources in a manner best suited to the needs of this select student population. Early intervention may not only help students develop the basic math and language skills in which they are deficient, but may also prevent damage to those students' self-esteem and school-related attitudes (Smith, Stuck, and Johnston, 1982). Simply, proficiency in basic skills leads to more positive student self-concepts and attitudes toward school (McCarthy, 1983).

Finally, the large educational groups such as the National Education Association, American Federation of Teachers, American Association of School Administrators, National School Boards Association, and Parent Teacher Association have all opposed MCT unless it is tied to remediation (Riegle & Lovell, 1980). This study provides a means to facilitate the tying of remediation to proficiency on the exam.

Description of the Study

This study was conducted for the Lubbock Independent School District in Lubbock, Texas as a joint effort which included research assistants assigned to the school district by the Texas Tech University's College of Education, faculty from Texas Tech University, and personnel within the district.

Lubbock Independent School District serves a student population of approximately 30,000 in a West Texas city of about 200,000. Lubbock is the center of a multi-county retail trade area located in a predominately agricultural area. The school system includes five high schools, eight junior high schools, and thirty-nine elementary schools.

Purposes of the Study

The study was conducted to address the following questions:

1. What measurable factors correlate with TEAMS scores?
2. Can certain factors be used to reliably predict TEAMS scores for individual students?
3. Can methods be devised to accurately predict TEAMS scores for most students, and can these methods be comfortably used by personnel within the district?
4. Can students at-risk to fail the TEAMS test(s) be accurately identified early enough to permit sufficient time for remediation?

Subjects

Subjects included in this study were 11th-grade L.I.S.D. students, representing each of the five high schools.

Design

After the first administration of the TEAMS test in October 1985, data on the 303 students who failed at least one portion of the TEAMS test were collected to determine what pertinent factors might explain their TEAMS performance. Ultimately, forty-four variables were examined for their contribution to TEAMS performance. These 44 variables are reported in the Appendix. Analysis of this data indicated that eight variables provided the most promise for predictive purposes. Data for these eight most significant variables were subsequently collected on a random sample of 200 students (proportionately representing each of the five high schools), comprised of students who passed (n=167) and students who failed (n=33) the TEAMS district-wide. Multiple regression analyses revealed prediction equations consisting of the variables best suited for predicting the scores of both the math and language portions of the TEAMS.

The efficacy of the prediction equations was evaluated by predicting TEAMS math and TEAMS language scores for a random sample of 108 L.I.S.D. students attending the high school with the highest TEAMS nonmastery rate who were scheduled to take the TEAMS test for

the first time in October 1986, and then comparing the predicted scores for each student with that student's actual scores.

Treatment of the Data

The first stage of this study required a correlation of the potential predictors of TEAMS performance with the 303 TEAMS-failing students' actual TEAMS scores. Accordingly, a Pearson product-moment correlation was conducted with list-wise deletion of missing data. From this, step-wise regressions were conducted to suggest which variables exerted the greatest influence on TEAMS scores. Results of these regressions suggested six variables that might most economically explain TEAMS scores, with analysis of variance indicating sex and ethnicity might be significant.

The second stage of the study required a determination of the relative effects of each of the eight most pertinent predicting variables on TEAMS performance (both math and language). As a result, additional step-wise regressions were conducted on a district-wide sample of 200 students (only 16.3% of this sample had failed some portion of the TEAMS test) to ascertain the most potent predictors of each TEAMS score. Multiple regression analyses were subsequently conducted to determine total predictive power as well as to generate the necessary equations and regression weights for each variable so that students' TEAMS scores could be predicted.

The final stage of this study required the prediction of TEAMS scores on a sample of 108 students prior to their taking the TEAMS,

and a comparison of these predicted scores with their actual scores later after they had taken the TEAMS test. This was done in two ways. First, students' predicted scores were subtracted from their actual scores; if the resulting difference was within the standard error of the particular regression equation, the score was recorded as accurate, or a "hit." Conversely, if the resulting difference exceeded the standard error of the regression equation, the score was recorded as inaccurate, or a "miss." A second method for evaluating the accuracy of the regression equations utilized a graphing of the student's actual versus predicted score, as described by Anastasi (1976). The graph was divided into four quadrants by using the State-mandated cutoff scores for passing (700 for the language graphs; 629 for the math graphs) as the axes. Students whose predicted/actual scores concurred (that is, the student was predicted to pass and did pass, or the student was predicted to fail and did fail) by falling into quadrants I or III were recorded as accurately identified; similarly, students whose predicted/actual scores differed (that is, the student was predicted to pass but instead failed, or the student was predicted to fail but instead passed) by falling into quadrants II or IV were recorded as inaccurately identified.

Demographic characteristics were additionally considered by analysis of variance techniques so that students might be more accurately assigned to an at-risk or not-at-risk category in future predictions.

All correlations, step-wise regressions, multiple regression analyses, and analyses of variance were computed using Version 2.1 of the SYSTAT program on a Leading Edge microcomputer with a 10 Megabyte hard disk.

Results and Discussion

Results

The first purpose of this study was to determine the most significant factors effecting TEAMS performance so that regression equations could be constructed which would most accurately predict TEAMS performance. Accordingly, a correlation matrix was computed using the 44 variables and the 303 failing students' TEAMS scores. Although several variables correlated with TEAMS scores, step-wise regressions were useful in reducing this number to only those variables particularly promising for explaining TEAMS scores. Results of these regressions indicated that the best predictors of TEAMS language scores were SFTAA 8th-grade Language IQ (an academic aptitude score on the Short Form Test of Academic Aptitude) (C8V), 6th-grade California Achievement Test-Total Reading-Obtained Grade Equivalent Score (R6), and 9th-grade Texas Assessment of Basic Skills (TABS) Total Writing Score (T9W). Similarly, the best predictors of TEAMS math scores were 8th-grade SFTAA Nonlanguage IQ (an academic aptitude score on the Short Form Test of Academic Aptitude) (C8N), 9th-grade Texas Assessment of Basic Skills (TABS) Total Math Score (T9M), and 10th-grade math course grade-point

average (4 point scale, over two semesters) (M10GR). The SFTAA Language and Nonlanguage IQ scores are reported as a portion of the California Achievement Test but are technically derived from the Short Form Test of Academic Aptitude (SFTAA) which is an optional test in the California Achievement Test battery. In 1985, TABS was changed, in name only, to TEAMS; however, to minimize confusion between variables, we have chosen to retain the pre-1985 TABS label for 9th-grade variables in this study. In addition to these six test scores, sex and ethnicity were shown to be significant to TEAMS performance by analysis of variance.

These results had a number of implications in directing future data collection. Particularly, these step-wise regressions supported the elimination of several of the variables which had been considered. Surprisingly, school attendance/absenteeism proved to be of minor importance in explaining TEAMS scores. However, concerns beyond statistical correlation also supported the elimination of some variables. First, variables such as 10th-grade TABS scores and reading scores were of little use because of the extremely small number of students who took the TABS in 10th grade or were enrolled in a corrective reading class. Second, 10th-grade measures, such as 10th-grade subject GPA's, simply by reflecting 10th-grade performance, allow little time for identification and remediation. Third, variables such as years retained, last year retained, compensatory program experience, and years in resource were all difficult to obtain due to confidentiality provisions

required by federal law (P.L. 94-142). In fact, policy in this school district restricts access to special education records to specific personnel, as well as requires permission from the Coordinator of Special Education prior to the examination of the records of any student so classified. Fourth, demographic characteristics were found to have limited value when assessed by analysis of variance for refining placement of students whose predicted scores were border-line for failing either the language or math section of the TEAMS test. When considered in the light of the legal and social issues encountered when the variables of sex and ethnicity are used as a means of catagorizing individuals, the use of these demographic variables is not advised. Finally, variables such as parental status, parental employment, and home language relied on self-reporting by students and may have been suspect. As a result, data collection for subsequent samples reported in this study only involved the eight variables identified as significant in the step-wise regressions.

As the second purpose of the study was to determine the relative effects of these factors in predicting TEAMS performance, a random sample of 200 students proportionately representing the five L.I.S.D. schools was selected; that is, if School A comprised 11% of the District's 11th-grade population, then twenty-two 11th-graders from that school were selected (11% * 200), etc. The district-wide failure rate of 16.3% was used to select 33 failers, again proportionately representing each of the five high schools.

After data for these eight most significant factors were collected on this sample, step-wise regressions were conducted to determine the major predictors of TEAMS performance. Results of these step-wise regressions verified the conclusions from the earlier examination of the 303 TEAMS failers.

Results of these step-wise regressions were used to direct the inclusion of particular variables in subsequent multiple regression analyses. Since more students can have their TEAMS scores predicted when the fewest number of variables are required (i.e., students are less likely to be excluded because of missing data), equations with the inclusion of minimum numbers of variables were tested along with those expected to explain the highest amounts of variance. Two examples of the results of these multiple regressions are reported in Tables 1 (TEAMS language) and 2 (TEAMS math), which can be found at the end of this paper.

Table 1 indicates that 67% of the variance in TEAMS language scores is attributable to scores on the R6, C8V, and T9W. Moreover, this table provides the equation for prediction of TEAMS language scores by giving the constant (407.105), and the coefficients for the R6 (12.812), C8V (2.129), and T9W (4.03). Table 2 similarly indicates that 70.9% of the variance in TEAMS math scores can be explained by scores on the T9M, C8N, and M10GR, with the constant and coefficients for use in predicting TEAMS math scores again provided. The standard error for each regression equation was obtained by taking the square root of the residual mean-square down in the analysis of variance section of each table.

Subsequent references to various regression equations will be in the form TL670, TM709, etc. The TL refers to an equation predicting TEAMS language scores and the 670 indicates the adjusted amount of variance (R^2) predicted by that particular equation. Similarly, TM refers to an equation devised to predict TEAMS math scores, with the 709 indicating the adjusted amount of variance (R^2) predicted by that particular equation. Six regression equations (TL670, TL656, TM709, TM698, TM687, and TM665), chosen by the amount of variance explained while using the smallest number of variables, were tested in this study.

Each of these six equations was used to predict TEAMS scores for a random sample of 108 students who were scheduled to take the TEAMS test(s) for the first time in October 1986. These predicted scores were compared with the actual scores (obtained in January 1987). First, predicted scores were subtracted from actual scores and tested to see if they fell within the standard error range. The results for all six equations are presented in Table 3.

A second test of each of these regression equations was conducted by plotting each student's predicted versus actual score for each of the TEAMS tests. These graphs are illustrated in Figures 1 (TL670), 2 (TL656), 3 (TM709), 4 (TM698), 5 (TM687), and 6 (TM665), which follow the tables at the end of this paper.

Discussion

While a number of variables indicate some correlation with TEAMS scores, the most significant appear to be the previous test scores; moreover, the fewer the number of variables needed to reliably predict TEAMS scores, and the less subjective they appear to school personnel and to the public, the less likely school personnel or the public are to resist the use of these variables in identifying potential at-risk students. Still, only about 65-70% of the variance in TEAMS scores can be adequately explained by these previous test scores, so additional variables need to be investigated. Particularly, motivational characteristics, self-concept measures, school attitudes, etc., may be useful in accounting for this unexplained variance. Additionally, concerns have been expressed about the validity and reliability of the T9W scores; accordingly, this study provides an equation (TL656) which excludes the T9W as a predictor and which may be more appropriate until the T9W becomes recognized as a more stable measure.

As Table 3 indicates, students' predicted scores concurred with their actual scores within one standard error 67-77 percent of the time. However, as the standard errors of the equations were somewhat large (a range of 45-68), predictions deviating from actual scores by as much as 68 points (for that particular equation) were still recorded as "accurate predictions." Interestingly, the math regression equations which included

students' math grade point averages were less accurate prediction equations than those limited to primarily "standardized" test scores. Future efforts to detect additional variables which might predict significant amounts of unexplained variance and thereby reduce the standard error of equations warrant consideration.

The regression equations tested suggest that students at risk to fail the TEAMS test(s) can be reliably identified prior to their taking the test in their 11th-grade year. As the graphs in Figures 1-6 perhaps offer the most useful method of evaluation of these equations, further clarification of these graphs is in order.

As earlier described, the axes of these graphs reflect the State-mandated cutoff scores for passing. However, the x-axis may be arbitrarily moved up or down since it refers to predicted scores; that is, the predicted score may be "adjusted" to better concur with actual scores, or more importantly, to minimize errors in Quadrants II and/or IV. For example, as the TM709 graph (see Figure 3) illustrates, the TM709 equation correctly identified 78% of the students in the final test sample. However, if the predicted cutoff score were raised from 629 (the x-axis) to 660 (the x'-axis), the equation becomes more accurate (85%); of greater importance, the number of students falling into Quadrant II (predicted to pass, but actually fail) drops to 6%. Thus, only 6% of students needing remediation prior to taking the TEAMS math test would fail to be identified by the TM665 equation. The x-axis can similarly be adjusted for the other equations to more effectively

minimize TEAMS failures. Table 4 indicates the effects on identification resulting from adjusting each equation.

The analyses of demographic variables have the potential to further guide the identification and remediation of students. However, the issue of race/ethnic and sex "discrimination" in connection with MCT programs must also be considered. McCarthy (1983) indicates there is some sentiment that MCT will result in resegregation. The disproportionate tracking of minority and English-deficient students into programs offering more restricted instructional opportunities could result in less chance of satisfying the competency standards for those students. Beyond the social and legal issues involved with the use of these demographic variables, the predictive power of such variables in this study does not warrant their use for placement of students into remediation programs.

The results of this study indicate that TEAMS scores for language and for math can be reliably predicted; moreover, these predictions can be made as early as the end of the student's 8th-grade year, allowing two full years for remediation if necessary. The choice of which regression equation to use for prediction of each TEAMS score, however, requires some policy decisions to be made by the particular school system. Some important considerations involving the use of these regression equations in remediation programs include the desired length of such a program, the most appropriate time in students' careers to involve them in

such a program, the number of students expected to be served by the program, and the costs incurred by the program. Essentially, three populations exist relative to being identified and remediated for the TEAMS test. First are the students who have spent the majority of their school years in a particular school district and thus have the necessary test records for identification by these equations. Second are the students who have some of the necessary test scores to be included in the projections although their predicted TEAMS scores may be less accurate than the first group, since equations using fewer variables and therefore explaining less variance must be used with this second group. Finally, a third group of students is comprised of students who are recent transfers into the district and who enter without the scores necessary for these equations. Since these latter two groups might also benefit from identification and remediation, some efforts at identifying which of these students might be at risk to fail the TEAMS, outside of the regression equation procedure here described, might be appropriate.

Consideration must further be given to the content of the remediation program to be initiated. Richman and Brown (1986) suggest that affective needs of these students should be met in addition to remediating their cognitive skills. Students academically at-risk who failed the North Carolina MCT were lower in self-esteem than at-risk students who passed the MCT (Richman, Brown & Clark, 1985). This may be due to repeated school

failures. The State of North Carolina, in evaluating students who took the state MCT in 1983 and 1984, found that 48% of initial MCT failers eventually passed the test (apparently with no remediation). Richman and Brown examined several remediation strategies used with students failing the North Carolina MCT. Students remediated with a 10-week treatment which included affective components provided by a teacher's aide showed substancially superior passing rates (74-84% passing) on retakes of the MCT. Such findings suggest that short, intensive remediation programs directed to the improvement of students' attitudes about themselves and test-taking may be particularly effective.

This study has indicated that previous test scores correlate with TEAMS scores sufficiently for reliable predictions to be made up to two years before a student will first take the TEAMS exit level test. Perhaps more importantly, these predictor variables reflect standardized tests commonly administered in Texas school systems, so that these identification equations may readily be utilized in other school districts. In a more general sense, this study has suggested which types of variables may be useful in predicting scores on MCT's, so that districts not using the SFTAA or the TABS might still have some direction in variable selection to generate their own prediction equations. Moreover, as only 4-6 variables must be collected for each student, various district personnel, without specialized training, can collect the relevant data and calculate predicted TEAMS scores with relative ease.

Finally, these equations permit school districts to reliably identify at-risk students with sufficient time to allow for a variety of remediation strategies to be considered.

The actual regression equations used in this study, including constants and variable coefficients, are available through Jerrell Snodgrass, Assistant Superintendent for Administration, Lubbock Independent School District, 1628 19th Street, Lubbock, Texas, 79401.

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TABLE 1

TEAMS LANGUAGE PREDICTION EQUATION USING C8V,R6, AND T9W

DEP VAR: TL N: 200 MULTIPLE R: .821 SQUARED MULTIPLE R: .675

$\text{ADJUSTED } R^2 = 1-(1-R^2)*(N-1)/DF$, WHERE N= 200, AND DF= 196: .670

VARIABLE	COEFFICIENT	STD. ERROR	STD. COEF.	TOLERANCE	T	P(2 TAIL)
CONSTANT	407.105	27.880	0.000	.	14.60	.000
C8V	2.129	0.385	0.370	0.36958	5.53	.000
R6	12.812	2.266	0.393	0.34339	5.65	.000
T9W	4.030	1.340	0.153	0.64603	3.01	.003

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	871115.401	3	290371.800	135.450	.000
RESIDUAL	420174.794	196	2143.749		

The standard error of this equation is 46.3.

TABLE 2

TEAMS MATH PREDICTION EQUATION USING C8N, T9M, AND **M10GR**

DEP VAR: TM N: 200 MULTIPLE R: .844 SQUARED MULTIPLE R: .713

ADJUSTED $R^2 = 1-(1-R^2)*(N-1)/DF$, WHERE N= 200, AND DF= 196: .709

VARIABLE	COEFFICIENT	STD. ERROR	STD. COEF.	TOLERANCE	T	P(2 TAIL)
CONSTANT	10.586	38.864	0.000	.	.27	.786
C8N	3.243	0.430	0.371	0.60400	7.53	.000
T9M	9.019	1.117	0.412	0.56327	8.07	.000
M10GR	23.126	4.186	0.240	0.77428	5.52	.000

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
REGRESSION	1904015.857	3	634671.952	162.242	.000
RESIDUAL	766730.018	196	3911.888		

The standard error of this equation is 62.545.

TABLE 3

Accuracy of Predicted TEAMS Scores

(N = 108)

Regression Equation (Variables)	Number Predictions Possible with This Equation	Percentage (of 108)	Standard Error of the Regression Equation	Accurate Predictions	Inaccurate Predictions	Total Number of Predictions	Percentage Accurate Predictions
TL670 C8V R6 T9W	78	72%	47	48	14	62	77%
TL656 C8V R6	90	83%	48	48	19	67	72%
TM709 C8N T9M M10GR	83	76%	63	45	22	67	67%
TM698 T9M C8V C8N	84	78%	64	52	17	69	75%
TM687 C8N T9M R6	79	73%	65	49	16	65	75%
TM665 T9M C8N	84	78%	68	47	22	69	68%

Note.
Variables:
C8V = 8th-grade Short Form Test of Academic Aptitude--Language IQ
R6 = 6th-grade California Achievement Test--Total Reading Obtained Grade Equivalent Score
T9W = 9th-grade Texas Assessment of Basic Skills--Total Writing Score

C8N = 8th-grade Short Form Test of Academic Aptitude--Nonlanguage IQ
T9M = 9th-grade Texas Assessment of Basic Skills--Total Math Score
M10GR = 10th-grade math course grade-point average (4 point scale, over two semesters)

TABLE 4

Results of Adjusting Predicted Score Cutoffs
(See Figure 3 for Graphic Depiction)
(N = 108)

Regression Equation (Variables)	State Cutoff (x-axis)	Percentage in Quadrant II	Percentage in Quadrant IV	Overall Accuracy	Adjusted Cutoff (x -axis)	Percentage in Quadrant II	Percentage in Quadrant IV	Overall Accuracy
LANGUAGE								
TL670	700	12.9%	9.7%	77%	710	6.5%	12.9%	81%
C8V								
R6								
T9W								
TL656	700	14.9%	7.5%	78%	710	9.0%	13.4%	78%
C8V								
R6								
MATH								
TM709	629	16.9%	4.6%	78%	660	6.0%	9.0%	85%
C8N								
T9M								
M10GR								
TM698	629	11.6%	11.6%	77%	638	5.8%	11.6%	83%
T9M								
C8V								
C8N								
TM687	629	12.3%	9.2%	78%	655	3.1%	13.8%	83%
C8N								
T9M								
R6								
TM665	629	11.6%	8.7%	80%	665	4.3%	14.5%	81%
T9M								
C8N								

Note.
Quadrant II = Predicted to Pass But Actually Failed
Quadrant IV = Predicted to Fail But Actually Passed
Variables
R6 = 6th-grade California Achievement Text--Total Reading Obtained Grade Equivalent Score
C8V = 8th-grade Short Form Test of Academic Aptitude--Language IQ
C8N = 8th-grade Short Form Test of Academic Aptitude--Nonlanguage IQ

T9W = 9th-grade Texas Assessment of Basic Skills--Total Writing Score
T9M = 9th-grade Texas Assessment of Basic Skills--Total Math Score
M10GR = 10th-grade math course grade-point average (4 point scale, over two semesters)

FIGURE 1. TEAMS LANGUAGE SCORE ($R^2 = .670$)
Predictor Variables: C8V, T9W, R6

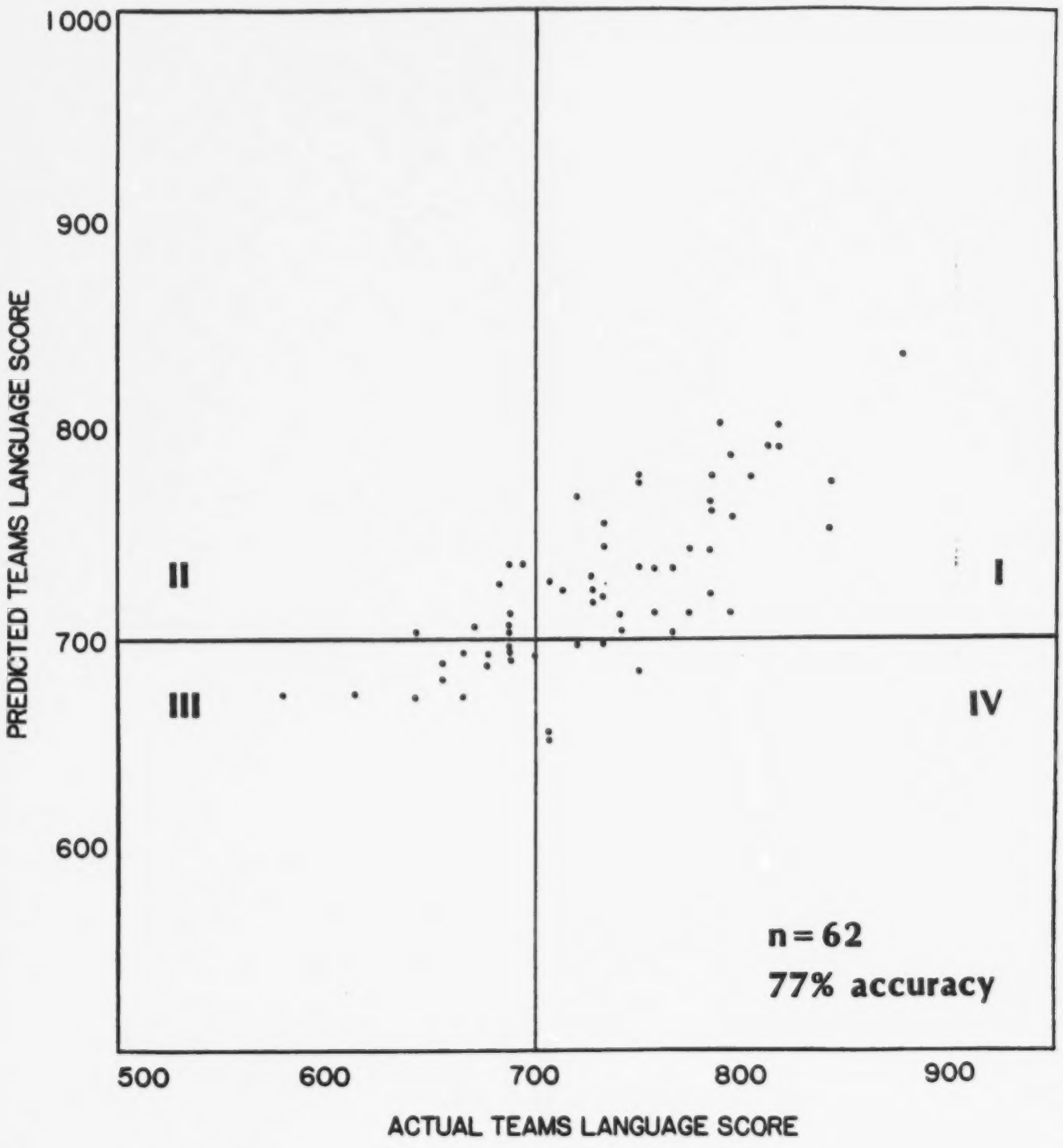


FIGURE 2. TEAMS LANGUAGE SCORE ($R^2 = .656$)
Predictor Variables: C8V, R6

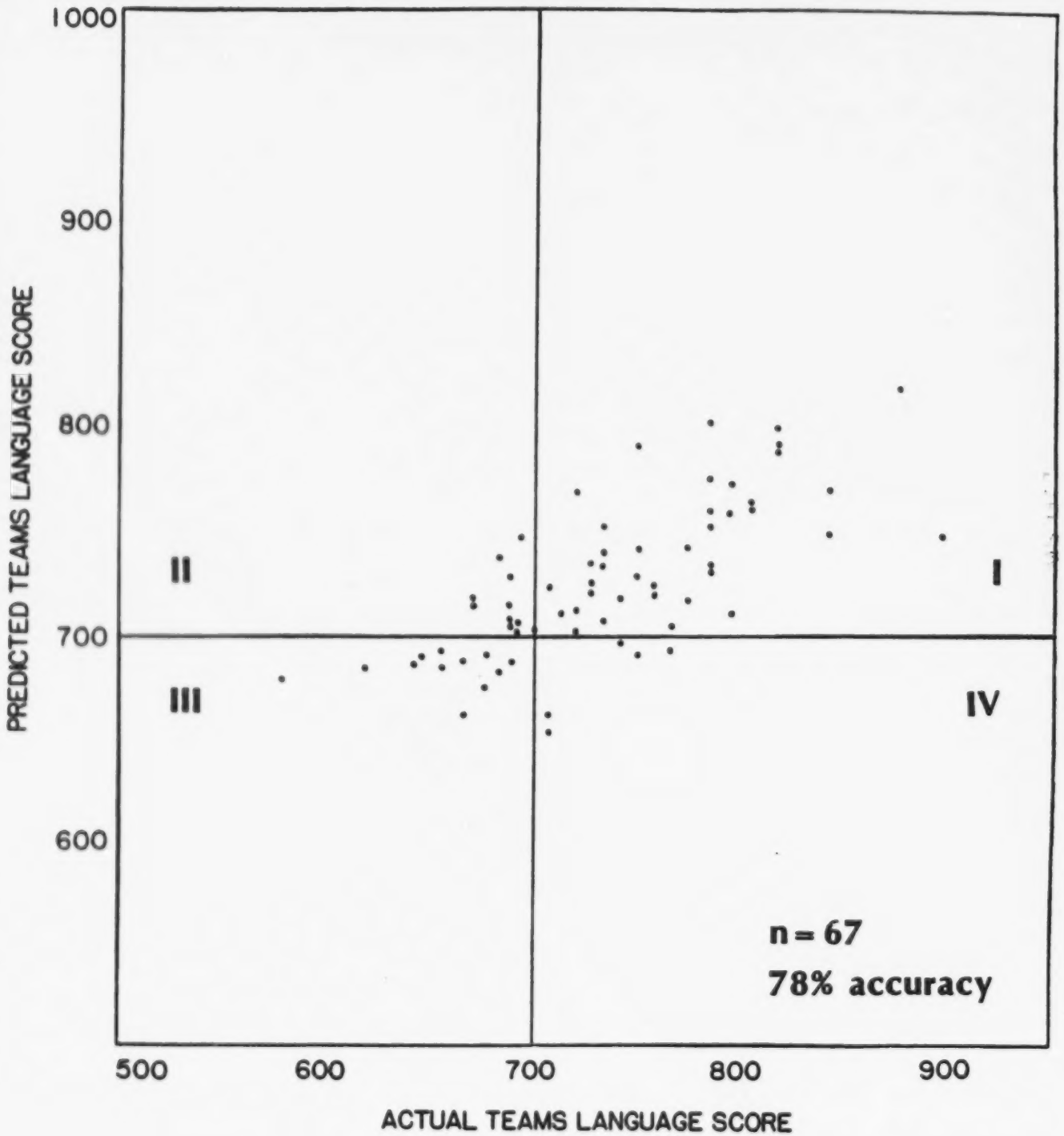


FIGURE 3. TEAMS MATH SCORE (R^2 = .709)
Predictor Variables: C8N, T9M, M10GR

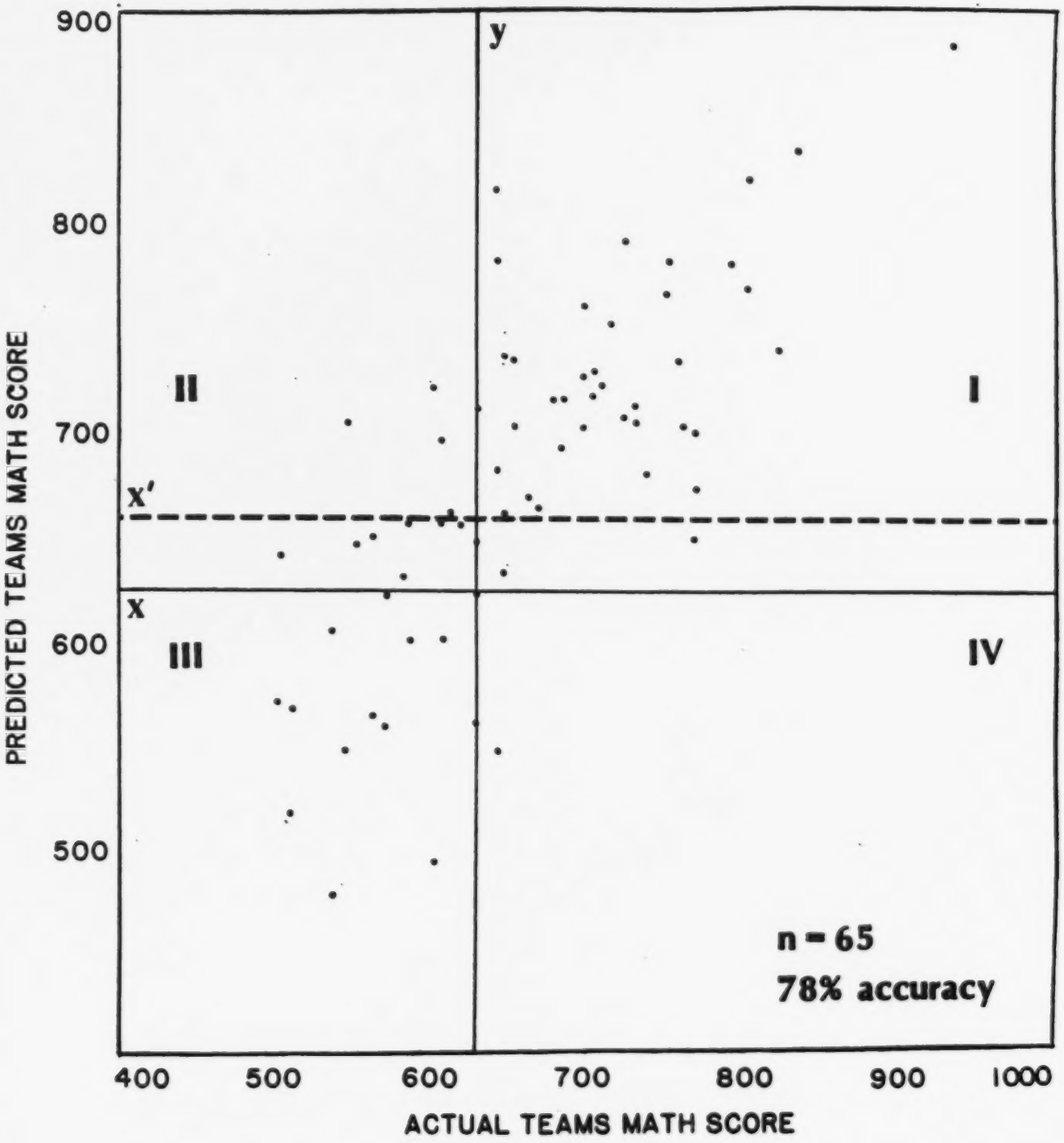


FIGURE 4. TEAMS MATH SCORE (R^2 = .698)
Predictor Variables: C8N, T9M, C8V

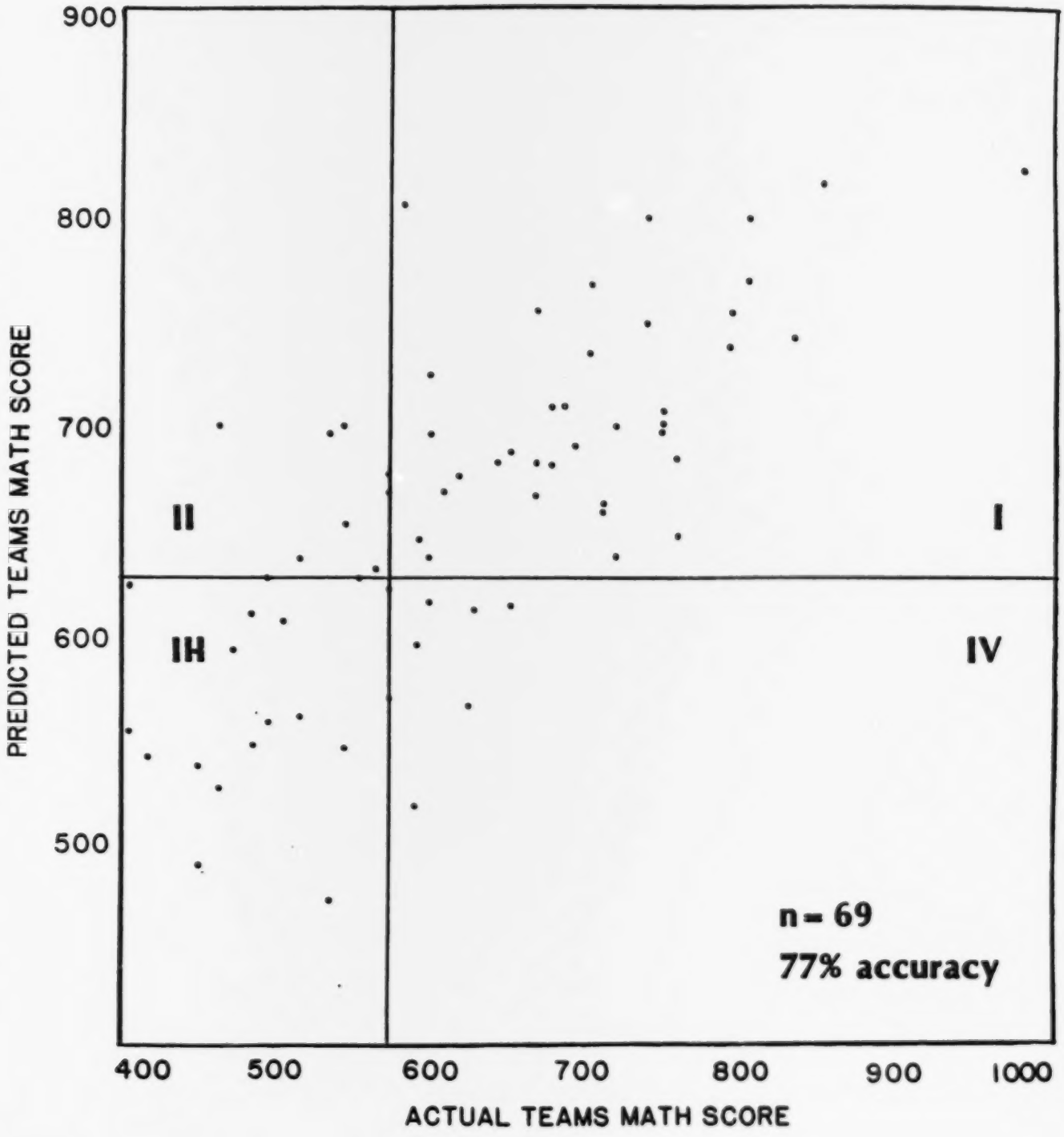


FIGURE 5. TEAMS MATH SCORE ($R^2 = .687$)
Predictor Variables: C8N, T9M, R6

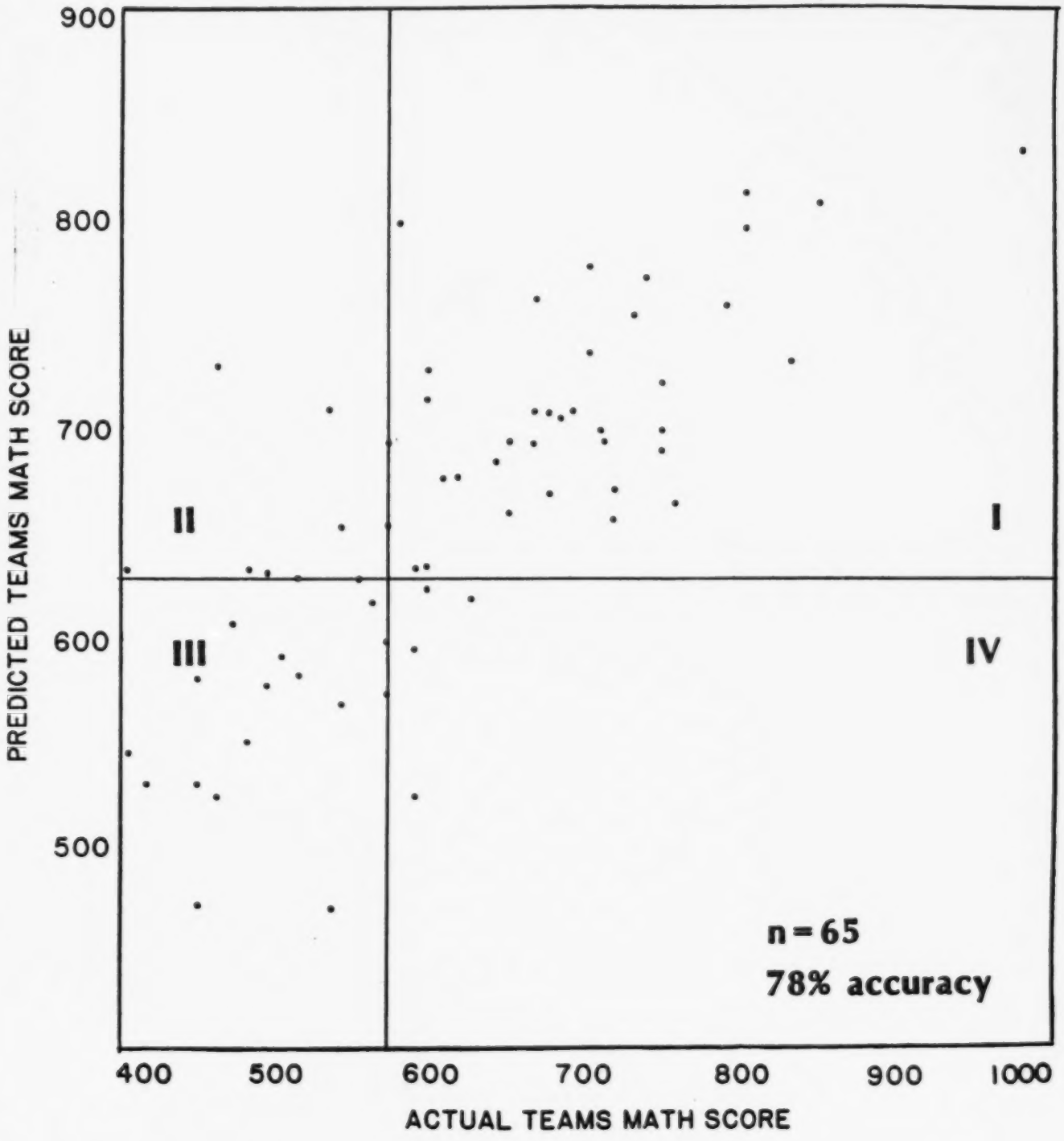
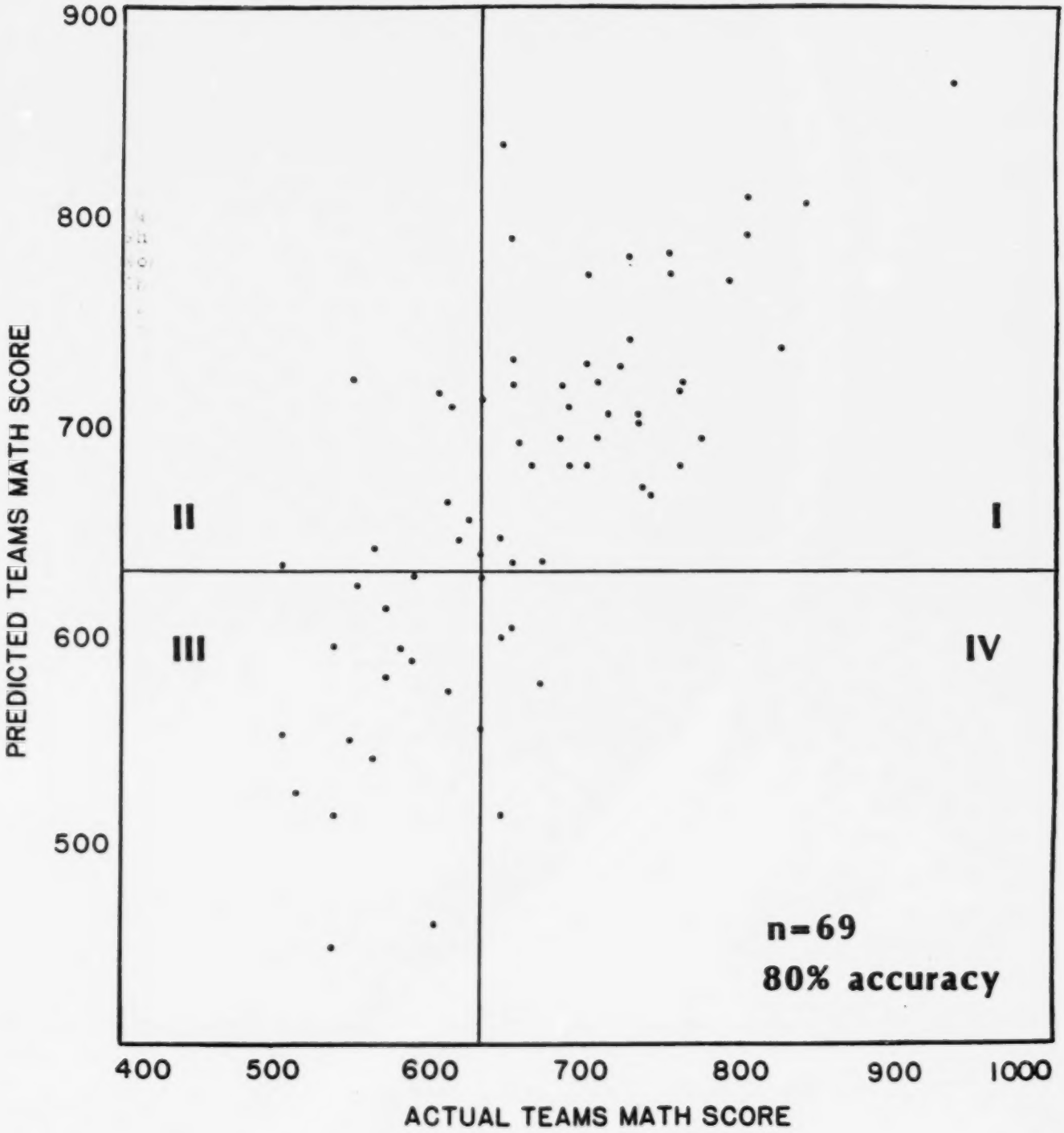


FIGURE 6. TEAMS MATH SCORE ($R^2 = .665$)
Predictor Variables: C8N, T9M



Appendix

TEAMS Study Variable List

Standardized Test Scores

1. TL = TEAMS Language Score (500-999, passing score in 1985 = 670, in 1986 = 700).
2. TM = TEAMS Math Score (350-999, passing score in 1985 = 612, in 1986 = 629).
3. R6 = California Achievement Test, 6th grade, Obtained Grade Equivalent, Total Reading.
4. ANGR6 = Anticipated Grade Equivalent reading level at 6th grade (SFTTA/CAT).
5. C8V = Short Form Test of Academic Aptitude, 8th grade, Language IQ.
6. C8N = Short Form Test of Academic Aptitude, 8th grade, Nonlanguage IQ.
7. C10V = Short Form Test of Academic Aptitude, 10th grade, Language IQ.
8. C10N = Short Form Test of Academic Aptitude, 10th grade, Nonlanguage IQ.
9. T9M = Texas Assessment of Basic Skills, 9th grade, math portion.
10. T9L = Texas Assessment of Basic Skills, 9th grade, language portion.
11. T9W = Texas Assessment of Basic Skills, 9th grade, writing portion.
12. T10M = Texas Assessment of Basic Skills, 10th grade, math portion.
13. T10L = Texas Assessment of Basic Skills, 10th grade, language portion.
14. T10W = Texas Assessment of Basic Skills, 10th grade, writing portion.

Student Academic Records

15. L9 = 9th grade language course (English = 1, Basic English = 13 (one semester), 15 (two semesters); Remedial English = 14 (one semester), 16 (two semesters); ESL = 7).
16. L9GR = Grade received for L9 (0 = F, 1 = D, 2 = C, 3 = B, 4 = A).
17. L10 = 10th grade language course (English = 2, Basic English = 23 (one semester), 25 (two semesters); Remedial English = 24 (one semester), 26 (two semesters); ESL = 7).
18. L10GR = Grade received for L10 (0 = F, 1 = D, 2 = C, 3 = B, 4 = A).
19. READ = Corrective reading course (coded as 3 if taken; otherwise coded as missing).
20. R-GR = Grade received for READ (0 = F, 1 = D, 2 = C, 3 = B, 4 =A).
21. M9 = 9th grade math course (Fundamentals of Math (F.O.M) = 1, Intro. Algebra = 2, Algebra = 3, Basic F.O.M. = 13 (one semester), 15 (two semesters); Remedial F.O.M. = 14 (one semester), 16 (two semesters); Other = 4).
22. M9GR = Grade received for M9 (0 = F, 1 = D, 2 = C, 3 = B, 4 = A).
23. M10 = 10th grade math course (Fundamentals of Math (F.O.M) = 1, Intro. Algebra = 2, Algebra = 3, Basic F.O.M. = 13 (one semester), 15 (two semesters); Remedial F.O.M. = 14 (one semester), 16 (two semesters); Other = 4).
24. M10GR = Grade received for M10 (0 = F, 1 = D, 2 = C, 3 = B, 4 = A).

Demographic Variables

25. SEX = (1 = Male, 2 = Female).
26. ETH = (1 = Indian; 2 = Asian; 3 = Black; 4 = Hispanic; 5 = White).
27. AGE = (in years and months).
28. HS = High School (1 = CHS, 2 = DSHS, 3 = LHS, 4 = MHS, 5 = EHS).
29. JH = Junior High School
30. ELM = Elementary School
31. SES = (Free Lunch Program) (1 = free lunch; 2 = reduced lunch; 0 = did not qualify).
32. ATT-6 = Attendance, first six weeks of 11th grade (six weeks prior to TEAMS administration).
33. ABS-6 = Absences during first six weeks of 11th grade.
34. Y-ATT = Days attended during 10th grade school year (year prior to TEAMS test year).
35. Y-ABS = Days absent during 10th grade school year.
36. RET = number of years retained in grade level(s).
37. LYRET = Last year retained (last grade level where student retained for year).
38. COMP = Number of years in compensatory programs (TITLE I, Migrant, Etc.).
39. RES = Number of years in Resource Classes (Special Education).
40. EXITY = Last year in Resource (last grade level).
41. D-O = Drop-out Status (Dropout = 1, Attending School = 2).

Self Reported Variables

42. P-S = Number of guardian adults in student's home.
43. P-E = Number of parents currently employed.
44. H-L = Home language (English = 0, Spanish or other = 1).